General

Guideline Title

Screening for cardiovascular disease and risk factors.

Bibliographic Source(s)

Singapore Ministry of Health. Screening for cardiovascular disease and risk factors. Singapore: Singapore Ministry of Health; 2011 Mar. 101 p. [189 references]

Guideline Status

This is the current release of the guideline.

Recommendations

Major Recommendations

Definitions of the levels of evidence (1++, 1+, 1-, 2++, 2+, 2-, 3, 4) and the grades of recommendations (A, B, C, D, and Good Practice Point [GPP]) are provided at the end of the "Major Recommendations" field.

Screening for Cardiovascular Risk Factors

Smoking

B - All patients should be asked if they use tobacco and their smoking status be documented on a regular basis. (Grade B, Level 2+)

B - Consistent update of smoking cessation status of every tobacco user is recommended at each clinical consultation. (Grade B, Level 2+)

Physical Activity

D - All patients aged 18 and older should be asked if they are participating in any physical activity and if so, the level, intensity, and duration, of such activity. (Grade D, Level 4)

Diet

D - It is recommended that each individual be screened for adherence to the Singapore Health Promotion Board's guidelines for healthy eating. (Grade D, Level 4)

Obesity

C - It is recommended that screening for obesity be done for individuals 18 years and older annually. The height, weight and waist circumference

should be measured and the body mass index be calculated. (Grade C, Level 2+)

Dyslipidemia

B - It is strongly recommended that clinicians routinely screen men and women aged 40 years and older for lipid disorders. (Grade B, Level 2++)

GPP - It is recommended that clinicians routinely screen younger adults (men aged and women aged 18 and older) for lipid disorders if they have other risk factors for coronary artery disease. (GPP)

GPP - It is recommended that clinicians review patients' lipid levels at regular levels depending on the risk categories and whether on lipid modifying drug therapy. (GPP)

Hypertension

D - Periodic screening for hypertension is recommended for all adults aged 18 years or older. Blood pressure (BP) should be measured at least once every 2 years for individuals with diastolic pressure below 80 mmHg and a systolic pressure below 130 mmHg (i.e., normal blood pressure). Measurements are recommended annually for persons with a diastolic BP of 80-89 mmHg or systolic BP of 130-139 mmHg (i.e., high normal BP). Persons with higher BPs or a major coronary risk factor such as diabetes mellitus require more frequent measurement. (Grade D, Level 4)

Evaluation of Blood Pressure

D - The following procedures are recommended when recording BP:

- Allow the patient to sit or lie down for several minutes before measuring the BP.
- The patient should refrain from smoking or ingesting caffeine during the 30 minutes preceding the measurement.
- Use a cuff with a bladder that is 12-13 cm × 35 cm in size, with a larger bladder for fat arms. The bladder within the cuff should encircle at least 80% of the arm.
- Use the disappearance of phase V Korotkoff sound to measure the diastolic BP.
- Measure the BP in both arms at the first visit.
- Take two or more readings separated by 2 minutes. Average these two values. If the first two readings differ by more than 5 mmHg, additional readings should be obtained and averaged.
- Measure the BP in both the standing and supine position for elderly subjects and diabetic patients.
- Place the sphygmomanometer cuff at the heart level, whatever the position of the patient.

(Grade D, Level 4)

Diabetes Mellitus

D - Screening of asymptomatic individuals for type 2 diabetes mellitus should be carried out on an opportunistic basis. Testing should be considered in adults of any age who have one or more risk factors for diabetes. In those without risk factors, testing should begin at 40 years. (Grade D, Level 4)

D - When screening for diabetes mellitus, fasting plasma glucose should be used. If the blood cannot be processed within 60 minutes, the blood should be placed in a tube containing sodium fluoride. (Grade D, Level 3)

B - In patients with typical symptoms, diabetes mellitus can be diagnosed if any one of the following is present[a]:

- Casual[b] plasma glucose >11.1 mmol/L
- Fasting[c,d,e] plasma glucose >7.0 mmol/L
- 2 h plasma glucose during oral glucose tolerance test[f] >11.1 mmol/L

> a. Where the diagnostic criterion is met in the absence of typical symptoms, a second confirmatory test should be performed on another day.
> b. Casual is defined as any time of day without regard to interval since last meal.
> c. Fasting is defined as no caloric intake for at least 8 hours.
> d. Fasting plasma glucose is the more convenient screening test when compared to the glucose tolerance test.
> e. Subjects with fasting glucose from 6.1 to 6.9 mmol/L should undergo an oral glucose tolerance test.
> f. 75 g oral glucose tolerance test should be performed according to World Health Organisation (WHO) recommendations.
>
> (Grade B, Level 2++)

GPP - It is recommended that hemoglobin A1c (HbA1c) not be used as a screening and diagnostic tool for diabetes mellitus until its performance in Singapore's multi-ethnic population has been evaluated. (GPP)

Screening for Asymptomatic Coronary Artery Disease

Global Cardiovascular Risk Assessment

C - In asymptomatic individuals it is recommended that the risk of cardiovascular disease first be estimated based on the global assessment of risk factors. (Grade C, Level 2+)

D - The Framingham Risk Score adapted to the Singapore population should be used to give an estimate of an individual's risk of major coronary artery disease events. (Grade D, Level 4)

A - People with diabetes should no longer be automatically assigned to the high risk category for cardiovascular risk. They should therefore be based on appropriate patients' coronary artery disease risk estimates. (Grade A, Level 1++)

Stratification for Cardiovascular Disease Risk

Low Risk Asymptomatic Individuals

C - In low risk individuals (<10% 10-year risk of coronary artery disease) further testing for coronary artery disease is not routinely recommended. (Grade C, Level 2++)

Intermediate and High Risk Asymptomatic Individuals

C - There is insufficient evidence to recommend for or against routine screening for coronary artery disease in asymptomatic individuals with intermediate (10% to 20% 10-year risk of coronary artery disease) or high risk (>20% 10-year risk of coronary artery disease). Given the lack of evidence, in intermediate and high risk asymptomatic individuals, further screening should be limited to the following selected situations:

- The exercise treadmill test (exercise treadmill testing) may be performed to: evaluate those with multiple risk factors as a guide to risk-reduction therapy; evaluate asymptomatic men older than 45 years of age and women older than 55 years of age who plan to start vigorous exercise, are involved in occupations in which impairment might impact public safety, or are at high risk for coronary artery disease because of other diseases; evaluate asymptomatic persons with diabetes who plan to start vigorous exercise.
- The coronary calcium score (CACS) on electron-beam computed tomography may be used in the intermediate coronary artery disease risk patient to decide if the patient should be reclassified to a higher risk status based on a high CACS.

(Grade C, Level 2++)

Cardiovascular Screening Tests Selectively Indicated

Resting Electrocardiography (ECG)

B - The routine use of resting ECG for screening for coronary artery disease in asymptomatic individuals is not recommended. (Grade B, Level 2++)

Exercise Treadmill Testing

B - Routine use of the exercise treadmill testing to screen for coronary artery disease in asymptomatic low-to-moderate risk individuals is not recommended. Its use among those in the highest risk group (10-year predicted coronary artery disease risk of 20%) may be considered. (Grade B, Level 2++)

Cardiac Stress Imaging

D - Cardiac stress imaging is not recommended for routine screening for coronary artery disease in asymptomatic patients at low risk. (Grade D, Level 4)

D - Cardiac stress imaging or stress echocardiography may be considered in a patient who has moderate to high risk of coronary artery disease and abnormal exercise ECG. (Grade D, Level 4)

D - Stress imaging is not useful for patients with no clinical risk factors who are undergoing intermediate-risk non-cardiac surgery. Such testing is also not useful for asymptomatic patients undergoing low-risk non-cardiac surgery. (Grade D, Level 4)

D - Cardiac stress imaging may be considered as pre-operative screening in asymptomatic individuals prior to non-cardiac surgery whose: (a) functional status is poor (less than 4 Mets) or unknown, (b) undergoing vascular surgery or intermediate risk surgery (intra-peritoneal and intra-thoracic surgery, carotid endarterectomy, head and neck surgery, orthopaedic surgery, prostate surgery) with (c) one or more risk factors (history of heart disease, history of compensated or prior heart failure, history of cerebrovascular disease, diabetes mellitus, or renal insufficiency) and (d) in whom the results of testing will change management. (Grade D, Level 4)

Coronary Artery Calcium Score (CACS)

D - The use of CACS by means of computerised tomography (CT) may be considered in selected situations, namely:

- Asymptomatic patients with intermediate coronary artery disease risk (between 10% and 20% 10-year risk of estimated coronary events) based on the possibility that such patients might be reclassified to a higher risk status based on high CACS, and subsequent patient management may be modified
- Patients who have atypical cardiac symptoms but otherwise considered to be at low risk of coronary disease, who may benefit from CACS to help in ruling out the presence of obstructive coronary disease

(Grade D, Level 4)

CT Coronary Angiography

D - Use of CT coronary angiography as a screening test in low and intermediate risk asymptomatic persons is not recommended. (Grade D, Level 4)

Carotid Intima-Media Thickness

C - Carotid intima-media thickness measurement is not recommended for routine cardiovascular disease screening. (Grade C, Level 2+)

Ankle-Brachial Index (ABI)

Peripheral Vascular Disease

D - It is recommended that the ABI be considered as a screening test for individuals with high risk for peripheral vascular disease, namely

- Age less than 50 years, with diabetes and one other atherosclerosis risk factor (smoking, dyslipidemia, or hypertension)
- Age 50-69 years and history of smoking or diabetes
- Age 70 years and older

(Grade D, Level 4)

Cardiovascular Disease

B - ABI may be considered for purpose of reclassification of an individual who has intermediate risk of coronary artery disease. (Grade B, Level 2+)

Biochemical Tests in Cardiovascular Screening

Lipid Screening

GPP - For lipid screening, it is recommended that testing be carried out on a venous sample sent for laboratory analysis and not from a finger-prick capillary sample tested on a physician office or bedside testing device. (GPP)

B - For lipid screening, it is recommended that a fasting venous sample should be collected for lipid levels of total cholesterol, triglycerides, high density lipoprotein cholesterol (HDL-C). The low density lipoprotein cholesterol (LDL-C) can be reported as a calculated value or as a directly measured result. (Grade B, Level 2++)

Lipoprotein(a), Apolipoproteins A1 and B

B - Lipoprotein(a) determination is not recommended for routine cardiovascular screening. (Grade B, Level 2++)

C - Further to a global cardiovascular risk assessment, lipoprotein(a) measurements may be useful in individuals with a strong family history of premature cardiovascular disease. (Grade C, Level 2+)

D - Routine apolipoprotein B determination is not recommended. (Grade D, Level 4)

Inflammation Biomarkers

High Sensitivity C-reactive Protein (CRP)

C - It is recommended that caution be exercised in the application of high sensitivity CRP as a screening test as risk prediction is not established in Asians and in the elderly. (Grade C, Level 2+)

B - The measurement of high sensitivity CRP is recommended only if the 10-year predicted risk based on standard global risk assessment is 5% or more. (Grade B, Level 2+)

GPP - If the high sensitivity CRP concentration is <3 mg/L, it does not need to be repeated. If the value is >3 mg/L, repeat the measurement at least 2 weeks later with patient in stable state, free of infection or acute illness. Select the lower of the 2 results as the patient's value. (GPP)

Homocysteine

GPP - Plasma homocysteine measurement is not recommended in cardiovascular screening. (GPP)

Fibrinogen

B - Fibrinogen measurement is not recommended for cardiovascular disease screening. (Grade B, Level 2++)

Natriuretic Peptides (Brain Natriuretic Peptide [BNP] and N-terminal Pro-BNP [NT-proBNP])

B - Natriuretic peptides (BNP and NT-proBNP) measurement is not recommended for cardiovascular disease screening. (Grade B, Level 2++)

Screening for Asymptomatic Cardiovascular Disease in Diabetes Mellitus and Chronic Renal Disease

Screening for Cardiovascular Risk Factors in Diabetes Mellitus

Global Cardiovascular Assessment

D - Global cardiovascular assessment is recommended for all patients with diabetes mellitus. (Grade D, Level 4)

Medical History, Physical Examination, Blood Pressure, Laboratory Tests, and ECG

D - It is recommended that the assessment of cardiovascular risk in persons with type 2 diabetes mellitus include a medical history, physical examination, blood pressure, fasting serum lipids, assessment of urine for microalbuminuria or proteinuria, and a resting ECG at baseline. (Grade D, Level 4)

Evaluation of People with Diabetes Mellitus Prior to Exercise

D - For asymptomatic individuals with diabetes above 40 years of age and intending to engage in more than low intensity exercise, a pre-exercise evaluation and a graded exercise stress ECG are recommended. (Grade D, Level 4)

Screening for Cardiovascular Risk factors in Chronic Kidney Disease

Screening for Cardiovascular Disease and Risk Factors

D - In patients at risk of chronic kidney disease, screening for risk factors for cardiovascular disease and for coronary artery disease is recommended at baseline and when patients become symptomatic of renal disease. (Grade D, Level 4)

Screening for Severity of Chronic Kidney Disease to Determine the Cardiovascular Disease Burden

D - Since the single most important determinant of cardiovascular disease burden is the severity of chronic kidney disease, screening for the presence and level of renal impairment is recommended. (Grade D, Level 4)

Screening for Abdominal Aortic Aneurysm, Peripheral Arterial Disease, Cerebrovascular Disease, and Atrial Fibrillation

Abdominal Aortic Aneurysm

B - Routine ultrasonographic screening of men 65 years and older for abdominal aortic aneurysm may be considered, particularly in those who have ever smoked (current and former smokers). (Grade B, Level 2++)

B - Routine screening for abdominal aortic aneurysm in women is not recommended. (Grade B, Level 2+)

Peripheral Vascular Disease

See under "Ankle Brachial Index" above.

Carotid Artery Stenosis

D - Routine screening for carotid artery stenosis is not recommended. (Grade D, Level 4)

Cerebrovascular Disease

GPP - Routine screening for cerebrovascular disease by magnetic resonance imaging (MRI) is not recommended. (GPP)

Atrial Fibrillation

B - Opportunistic screening for atrial fibrillation should be routinely performed for all patients by examining the rate and rhythm by pulse palpation, followed by ECG if atrial fibrillation is suspected. (Grade B, Level 2++)

Pre-participation Screening for Exercise

Risk-Stratified Pre-participation Screening

D - Pre-participation screening should be done on risk-stratified groups of athletes. (Grade D, Level 4)

D - All sports participants and national athletes should preferably undergo an appropriate level of annual pre-participation screening. (Grade D, Level 4)

D - Sports participants involved in strenuous sporting activities, but at a less competitive level than national athletes, should be encouraged to undergo voluntary pre-participation screening. (Grade D, Level 4)

D - Participants in sports and recreational activities should be encouraged to complete a self-administered pre-participation screening questionnaire annually, and consult a doctor if the questionnaire indicates it. (Grade D, Level 4)

Screening Protocols

D - For pre-participation screening, a two- or more stage screening process is encouraged, where the first stage consists of personal and family history taking and physical examination. Based on the findings of the first stage, further tests such as a resting ECG (if not already done), chest X-ray, exercise stress test, echocardiogram, blood investigations, urine tests, etc. may be ordered if indicated. (Grade D, Level 4)

GPP - Abbreviated screening protocols are acceptable in the intervening years between the full screenings. (GPP)

Definitions:

Levels of Evidence

Level	Type of Evidence
1++	High quality meta-analyses, systematic reviews of randomised controlled trials (RCTs), or RCTs with a very low risk of bias
1+	Well conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias
1-	Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias
2++	High quality systematic reviews of case control or cohort studies. High quality case control or cohort studies with a

Level	Type of Evidence
1++	very low risk of confounding or bias and a high probability that the relationship is causal
2+	Well conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal
2-	Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal
3	Non-analytic studies, e.g., case reports, case series
4	Expert opinion

Grades of Recommendation

Grade	Recommendation
A	At least one meta-analysis, systematic review of randomised controlled trials (RCTs), or RCT rated as 1++ and directly applicable to the target population; or A body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results
B	A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 1++ or 1+
C	A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 2++
D	Evidence level 3 or 4; or Extrapolated evidence from studies rated as 2+
GPP (good practice points)	Recommended best practice based on the clinical experience of the guideline development group

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

- Cardiovascular disease and conditions that increase the risk for cardiovascular disease including hypertension, diabetes, hyperlipidemia, and obesity
- Asymptomatic coronary artery disease
- Asymptomatic cardiovascular disease in diabetes mellitus and chronic renal disease
- Abdominal aortic aneurysm
- Peripheral arterial disease
- Cerebrovascular disease
- Atrial fibrillation

Guideline Category

Counseling

Prevention

Risk Assessment

Screening

Clinical Specialty

Cardiology

Endocrinology

Family Practice

Geriatrics

Internal Medicine

Nephrology

Preventive Medicine

Sports Medicine

Intended Users

Advanced Practice Nurses

Nurses

Patients

Physician Assistants

Physicians

Guideline Objective(s)

- To update the topics in the 2003 edition of the Singapore Ministry of Health (MOH) health screening related to cardiovascular disease and risk factors
- To provide guidance on the use of new cardiovascular biomarkers, pre-participation screening for exercise, screening of asymptomatic cardiovascular disease in diabetes mellitus, chronic renal disease, abdominal aortic aneurysm, peripheral vascular disease, cerebrovascular disease, and atrial fibrillation

Target Population

Individuals in Singapore who are asymptomatic but who may be at risk for cardiovascular disease

Interventions and Practices Considered

1. Screening for cardiovascular risk factors
    - Smoking status
    - Physical activity

    - Healthful diet
    - Obesity (height, weight, waist circumference, body mass index)
    - Dyslipidemia (lipid levels)
    - Hypertension (blood pressure measurement)
    - Diabetes (fasting or casual plasma glucose)
2. Screening for asymptomatic coronary artery disease
    - Global assessment of risk factors
    - Framingham risk score
    - Exercise treadmill test
    - Cardiac stress imaging or stress echocardiography
    - Coronary calcium score (CACS)
    - Ankle brachial index
3. Biochemical tests in cardiovascular screening
    - Lipid screening
    - Lipoprotein(a) determination in individuals with a strong family history of premature cardiovascular disease
    - Inflammation biomarkers (high-sensitivity C-reactive protein)
    - Natriuretic peptides (BNP and NT-proBNP) (not recommended for cardiovascular disease screening)
4. Screening for cardiovascular risk factors in diabetes mellitus
5. Screening for cardiovascular risk factors in chronic kidney disease
6. Routine ultrasonographic screening of men 65 years and older for abdominal aortic aneurysm (routine screening of women not recommended)
7. Routine screening for carotid artery stenosis (not recommended)
8. Opportunistic screening for atrial fibrillation
9. Pre-participation screening for exercise

Note: The following were considered but not recommended: routine use of resting electrocardiography (ECG) in asymptomatic patients at low risk, computed tomography coronary angiography in low or intermediate risk asymptomatic patients, routine use of carotid intima-media thickness measurement, routine lipoprotein(a) determination, routine apolipoprotein B determination, plasma homocysteine measurement, fibrinogen measurement, and routine use of magnetic resonance imaging for cerebrovascular disease.

Major Outcomes Considered

- Prevalence of cardiovascular risk factors
- Accuracy, sensitivity, specificity, positive predictive value, prognostic value, and diagnostic yield of screening tests
- Cardiac morbidity and mortality associated with cardiovascular risk factors
- Protective effect of prevention measures on cardiovascular risk
- Changes in the risk of cardiac events associated with screening tests
- Risk of sudden death or injury during exercise
- Cost-effectiveness

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Searches were run on PubMed (1966-2010), EMBASE (1947-2010), and the Cumulative Index to Nursing & Allied Health (CINAHL) database (1984-2010) for searching evidence related to screening of cardiovascular disease and risk factors. Additionally, both the Cochrane Library (2010, Issue 8) and the Centre for Reviews and Dissemination databases (DARE, NHS EED and HTA) were searched for systematic

reviews and cost-effectiveness studies. The guideline developers also performed Internet search on websites of guidelines agencies and professional societies that published clinical practice guidelines and consensus evidence on the given condition. These include the search for the last five years of the existing clinical practice guidelines (2006-2010) from sources of overseas guidelines agencies and professional bodies, e.g., National Guideline Clearinghouse, National Health Service (NHS) National Library of Guidelines, the Guidelines International Network, Agency for Healthcare Research and Quality (AHRQ), Canadian Medical Association (CMA) Clinical Practice Guidelines, New Zealand Guidelines Group, Australia's Clinical Practice Guidelines Portal websites.

Inclusion/exclusion criteria were used specific to the clinical questions to be answered. In general, search filters were used to further focus the type of studies to randomised controlled trials and systematic reviews of randomised controlled trials. If there is a paucity of higher level evidence, lower level evidence may be considered.

The searches used keywords and MeSH headings or the controlled vocabulary specific to the databases for the condition specified.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Levels of Evidence

Level	Type of Evidence
1++	High quality meta-analyses, systematic reviews of randomised controlled trials (RCTs), or RCTs with a very low risk of bias
1+	Well conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias
1-	Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias
2++	High quality systematic reviews of case control or cohort studies. High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal
2+	Well conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal
2-	Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal
3	Non-analytic studies, e.g., case reports, case series
4	Expert opinion

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Not stated

Rating Scheme for the Strength of the Recommendations

Grades of Recommendation

Grade	Recommendation
A	At least one meta-analysis, systematic review of randomised controlled trials (RCTs), or RCT rated as 1++ and directly applicable to the target population; or A body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results
B	A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 1++ or 1+
C	A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 2++
D	Evidence level 3 or 4; or Extrapolated evidence from studies rated as 2+
GPP (good practice points)	Recommended best practice based on the clinical experience of the guideline development group

Cost Analysis

See Section 8 of the original guideline document for a discussion of cost-effectiveness issues.

Method of Guideline Validation

Not stated

Description of Method of Guideline Validation

Not applicable

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate screening of cardiovascular diseases and risk factors, with the goal of enabling lifestyle interventions to be undertaken to reduce the burden of cardiovascular disease

Potential Harms

- The uncertain benefit of screening for asymptomatic coronary artery disease would need to be balanced against the possible harm from screening. The possible consequences of screening such as false positive or false negative results, need for further testing, and/or risks from radiation or stress should be explained to the subject prior to testing.
- There is good evidence of important harms of screening for abdominal aortic aneurysm and early treatment, including an increased number of surgeries with associated clinically-significant morbidity and mortality, and short-term psychological harms.

Qualifying Statements

Qualifying Statements

- These guidelines are not intended to serve as a standard of medical care. Such standards are determined on the basis of all clinical data available for an individual case and are subject to change as scientific knowledge advances and patterns of care evolve.
- The contents of this publication are guidelines for clinical practice, based on the best available evidence at the time of development. Adherence to these guidelines may not ensure a successful outcome in every case. These guidelines should neither be construed as including all proper methods of care, nor exclude other acceptable methods of care. Each physician is ultimately responsible for the management of his/her unique patient, in the light of the clinical data presented by the patient and the diagnostic and treatment options available.
- Evidence based clinical practice guidelines are by nature constantly evolving. New, emerging evidence could always supersede these guidelines and users need to be aware of this. The workgroup advises that these guidelines be scheduled for review in 3 years after publication or if it was felt that new evidence was available that would require substantive amendments to the current set of guidelines.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Audit Criteria/Indicators

Chart Documentation/Checklists/Forms

Patient Resources

Quick Reference Guides/Physician Guides

Resources

Slide Presentation

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Singapore Ministry of Health. Screening for cardiovascular disease and risk factors. Singapore: Singapore Ministry of Health; 2011 Mar. 101 p. [189 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2011 Mar

Guideline Developer(s)

Singapore Ministry of Health - National Government Agency [Non-U.S.]

Source(s) of Funding

Singapore Ministry of Health

Guideline Committee

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Financial Disclosures/Conflicts of Interest

Not stated

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Available from the Singapore Ministry of Health Web site .

Print copies: Available from the Singapore Ministry of Health, College of Medicine Building, Mezzanine Floor 16 College Rd, Singapore 169854.

Availability of Companion Documents

The following are available:

- Screening for cardiovascular disease and risk factors. Executive summary of recommendations. Singapore: Singapore Ministry of Health; 2011 Jan. 12 p. Electronic copies: Available in Portable Document Format (PDF) from the Singapore Ministry of Health Web site .
- Various slide sets and videos for cardiovascular screening, global risk assessment, additional tests for cardiovascular risk, cardiovascular screening in diabetes mellitus, cardiovascular screening in renal patients, and taking action are available from the Singapore Ministry of Health Web site .

In addition, the Sudden Arrhythmia Death Syndrome Foundation Questionnaire and information about other screening tests are available in the appendices to the original guideline document .

Self-assessment questions and clinical quality improvement indicators are also available in the original guideline document .

Patient Resources

The following is available:

- Your guide to understanding screening for heart disease. Singapore: Singapore Ministry of Health; 2011. 12 p. Electronic copies: Available in Portable Document Format (PDF) from the Singapore Ministry of Health Web site .

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical

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NGC Status

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